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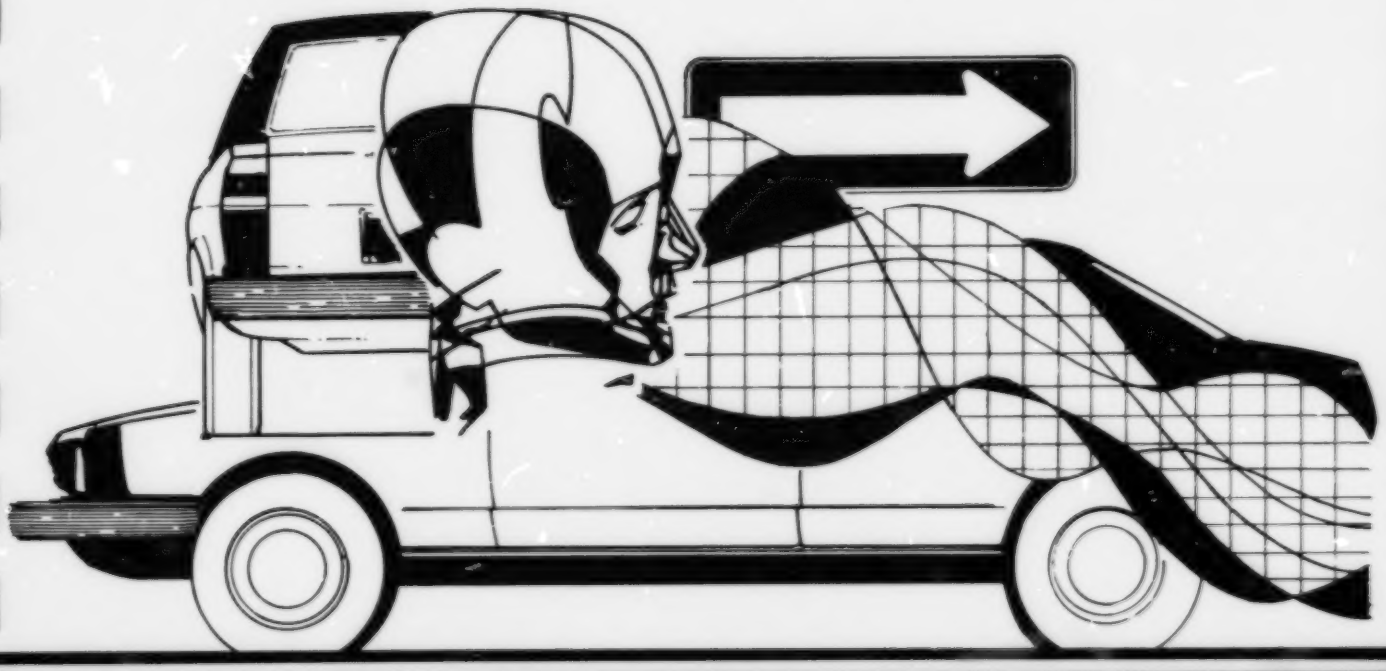
AN ANALYSIS OF CANADIAN SCHOOL BUS ACCIDENT RECORDS 1982 - 83 - 1984 - 85



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AN ANALYSIS OF CANADIAN SCHOOL BUS ACCIDENT RECORDS

1982-83 - 1984-85

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17 Abstract

Police reported records of road accidents involving school buses which occurred in Canada during the academic years 1982-83, 1983-84 and 1984-85 were analyzed.

Environmental, victim, driver and vehicle characteristics of these school bus accidents were examined. The major findings were that:

- During this period, motor vehicle occupants were approximately 16 times more likely than school bus occupants to be injured in road accidents per passenger kilometre of travel.
- During the three academic years examined six school bus passengers were killed - five in 1982-83 and one in 1984-85.
- Most student fatalities occurred when the victims were run over by school buses (4, 4 and 6 respectively during this period).
- During these three school years, more pupils suffered major injuries (those which required hospitalization) when run over by school buses (21, 14 and 18) than as passengers inside school buses (20, 19 and 8).
- The number of school bus passengers who received minor or minimal injuries during these years were 348, 343 and 315 respectively.
- 30% of fatal school bus accidents were single vehicle collisions, most of which resulted in pedestrian fatalities.

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1. Introduction

At present, school bus accident information is not collected regularly on a national basis. The last study of school bus accidents in Canada was completed by Transport Canada staff in 1978* and focused on school bus collisions which occurred in 1975.

This report is a special compilation and analysis of information on road accidents involving school buses which occurred in Canada during the 1982-83, 1983-84 and 1984-85 academic years (September-June). The accident information used in this study comes from Transport Canada's national file of police-reported accidents, and is supplemented by school bus usage characteristics provided by provincial Departments of Education. Neither of these sources provide complete national statistics and national totals have therefore been arrived at by extrapolation.

The principal objectives of this study are to provide the most current national estimates of school bus collisions and resulting casualties and to summarize the more relevant environmental, victim, driver and vehicle characteristics of school bus accidents during this three year period.

Hopefully, the presentation of recent national school bus accident data will provide concerned individuals and organizations with more factual information with which to assess school bus safety.

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* School Bus Accident Study, Transport Canada TSME 7801.

2. Pupil Transportation Characteristics

Before examining school bus accident statistics in Canada, it is worth briefly discussing the more relevant indicators of pupil transportation.

Indicators such as the number of pupils transported, school buses used and estimates of school bus travel illustrate the magnitude of pupil transportation in Canada and put into perspective the number of school bus accidents and resulting casualties which occur each academic year.

Statistics in Tables A1 and A2 in Appendix A indicated that during the three academic years examined, approximately 40 percent (1.9 million) of the 4.7 million pupils enrolled in elementary and secondary schools were transported to and from school daily. Prince Edward Island had the highest percentage of its enrolled pupils bused to school daily (approximately 75 percent), while British Columbia had the lowest (25 percent). Quebec and Ontario transported the largest number of pupils to school daily - approximately 600,000 in each province.

During these three school years, the number of school buses carrying students to school varied from approximately 35,300 in 1982-83 to about 37,000 in 1984-85. These buses travelled an estimated 660 to 695 million kilometres each school year. The average number of pupils carried per bus daily varied from 24 in Saskatchewan to 105 in British Columbia. The high figures in British Columbia and to a lesser extent in New Brunswick and Newfoundland probably resulted from multiple trips by some school buses.

The average daily distance travelled per bus varied from 32 kilometres in Newfoundland to 148 kilometres in Saskatchewan.

3. Data Base and Analysis

The Traffic Accident Information Data system (TRAID), which is a compilation of all police reported road accidents submitted annually to Transport Canada by each province and territory, was used to produce all statistical tables of school bus accidents (see Appendix B) found in this study.

The accident records that were selected for analysis from TRAID included only those which involved school buses and which occurred on public property.

School bus accident information was not available nationally from TRAID. However, records of road accidents involving school buses were identifiable from the TRAID system in at least four provinces - Quebec, Ontario, Saskatchewan and British Columbia - during each of the three academic years that these accident figures were being analysed. School bus collision data were also identifiable from the TRAID system in Nova Scotia during 1982-83 and New Brunswick and Manitoba during 1984-85.

The analysis in this report is based on statistical tabulations of single variable factors that describe characteristics of reportable traffic accidents. The statistical tables which include information on driver, vehicle and environmental characteristics of collisions involving school buses are classified according to accident severities (fatal, personal injury and property damage) while the tables which include victim data are categorized according to injury severities (fatal, major, minor and minimal).

4. Results

All school bus accident and casualty statistics discussed in this report are found in Appendix B. These figures are national estimates which have been arrived at by extrapolation since national statistics were not available from TRAID.

National figures were estimated by assuming that the ratios of average school bus accidents and casualties per million kilometres of travel in provinces where school bus accident data were identifiable from TRAID were identical to the school bus accident and casualty experience per million kilometres travelled by school buses in provinces where collision data were not identifiable from TRAID. These statistical tables should be quite accurate because the annual school bus accident and casualties ratios are based on figures from at least four provinces - Quebec, Ontario, Saskatchewan and British Columbia - that represent approximately seventy percent of all pupils transported, school buses used, estimated school bus travel and by inference school bus accidents and casualties.

4.1 & 4.2 Total Accidents and Casualties Involving School Buses - Tables B1 and B2

Tables B1 and B2 summarize total accidents and casualties involving school buses. The small number of fatalities in Table B2 allow no detection of annual trends to be made, and are probably more reasonably combined to give three year annual averages. These would show annual totals of about 18 fatalities, of which about 9 were occupants of vehicles other than the school bus, 6 were pedestrians, 2 school bus passengers and one school bus driver.

Of victims injured in school bus accidents, nearly half were occupants of other vehicles, one-third school bus passengers, approximately 10 percent pedestrians and 10 percent school bus drivers.

4.3 Accident Severity by Time of Collision - Table B3

As expected, most collisions occurred during the peak travel periods - 7 A.M.-11 A.M. - (38-40%) and 3 P.M.-7 P.M. - (36%) - when most travel occurred. Interestly, 18-21% of collisions occurred during the 11 A.M.-3 P.M. time period. The distribution of collisions according to time periods were quite consistent for all school years examined.

4.4 Accident Severity by Month of Occurrence - Table B4

Although the numbers were very small (school buses involved in fatal collisions accounted for fewer than 1% of total road accidents involving school buses each school year), the majority of fatal school bus accidents occurred during December and January (5,8 and 6 respectively for the 1982-83, 1983-84 and 1984-85 school years). May of the 1982-83 academic year was an exception when 7 fatal collisions occurred.

Personal injury accidents were more evenly distributed throughout all the months of the school year, although slightly higher percentages of collisions occurred during the winter months. Injury producing collisions were highest in March of 1982-83 (2.8%) in January of 1983-84 (2.7%) and February of 1984-85 (3.3%).

Property damage collisions also occurred more frequently during the winter months with the largest percentage of collisions occurring during November and January of 1982-83 (10.3% and 11.4%), during December and January of 1983-84 (14.6%) and 14.5%) and during January and February of 1984-85 (12.5% and 12.7% respectively).

4.5 Accident Severity by Light Condition - Table B5

As was expected, almost all accidents involving school buses occurred in 'daylight' conditions when school bus use was at its peak. In 1982-83, 90.5% of school bus accidents occurred in 'daylight' conditions, while the corresponding figures for 1983-84 and 1984-85 were 89.5% and 91.8% respectively.

Fewer than 4.0% of school bus collisions occurred each school year at 'dawn' or 'dusk', while 5.5%, 6.1% and 4.5% of accidents occurred in 'dark' conditions during 1982-83, 1983-84 and 1984-85 respectively.

4.6 Accident Severity by Place of Occurrence - Table B6

During the 1982-83 and 1983-84 school years, the majority of fatal accidents involving school buses occurred in rural areas (13 of 19 and 12 of 18 respectively), while in 1984-85, most fatal school bus collisions happened in urban areas (8 of 12). These year to year inconsistencies were probably due to the small number of fatal accidents involving school buses.

However, both personal injury and property damage accidents demonstrated a consistent pattern of occurring in far greater numbers in urban as opposed to rural areas.

Injury producing collisions which occurred in urban areas accounted for 11.4%, 10.9% and 12.5% respectively of all school bus accidents during the three academic years examined while the corresponding figures for personal injury accidents which occurred in rural areas were 7.1%, 6.4% and 8.2% respectively.

The differences in the distribution of urban versus rural collisions were more pronounced for property damage collisions. During 1982-83, 1983-84 and 1984-85, 53.0%, 60.2% and 56.0% respectively of all school bus accidents were property damage only collisions which occurred in urban areas compared with 19.4%, 18.8% and 18.6% which happened in rural areas.

4.7 Accident Severity by Road Surface Type - Table B7

All but one fatal school bus accident (in 1982-83) took place on paved roads, while overall 90.9%, 92.3% and 90.1% of all collisions involving school buses occurred on paved roads during the 1982-83, 1983-84 and 1984-85 school years. The remaining collisions occurred on unpaved roads.

4.8 Accident Severity by Road Surface Condition - Table B8

The majority of fatal accidents which involved school buses occurred on dry roads (12 of 19 fatal collisions in 1982-83, 10 of 18 in 1983-84 and 5 of 12 in 1984-85). The distribution of the remaining fatal accidents was evenly split between wet and snow/ice/slush road conditions.

The largest percentage of personal injury accidents also occurred on dry roads (9.7%, 8.0% and 10.1% of all school bus accidents from 1982-83 to 1984-85) while the remaining

injury producing school bus collisions were evenly distributed on wet (5.2%, 3.9% and 4.7%) and snow/ice/slush (4.5%, 5.7% and 6.0%) road conditions.

The distribution of property damage collisions differed from fatal and personal injury collisions in that a similar percentage of property damage collisions occurred on snow/ice/slush covered road (26.7%, 35.2% and 31.0) as on dry roads (33.8%, 30.0% and 32.6%) during the three school years in question, while a much smaller proportion of property damage accidents happened on wet roads (18.5%, 15.5% and 13.9% from 1982-83 to 1984-85).

4.9 Accident Severity by Weather Condition - Table B9

Most fatal road accidents involving school buses occurred in clear weather conditions (13 of 19, 17 of 18 and 10 of 12) during the 1982-83 to 1984-85 school years.

Clear weather conditions were also prevalent for most collisions resulting in injuries (13.9%, 14.1% and 15.8% of all school bus collisions) during the three academic years examined. Rainy weather conditions were in evidence in 3.2%, 1.1% and 1.7% of personal injury accidents while 1.5%, 1.7% and 2.5% injury producing collisions occurred in snowy weather conditions during this three year period. Clear weather conditions prevailed in 59.9%, 61.9% and 61.3% of all property damage collisions involving school buses which occurred during these three years. Rainy and snowy weather conditions were in evidence for 10.1%, 5.9%, 4.3% and 8.6%, 11.7% and 10.7% respectively of accidents resulting in property damage only.

4.10 School Bus Occupant and Pedestrian Casualties by Injury Severity - Table B10

During the three academic years that road accident data involving school buses were examined, 689, 546 and 526 school bus occupants or pedestrians hit by school buses in the vehicle loading zone were injured or killed in reportable collisions. Of this victim total, 2.3%, 1.0% and 1.7% were fatally injured during the three year period while 8.7%, 8.1% and 7.2% sustained major* injuries. Minor** and minimal*** injuries accounted for 59.1%, 55.4% and 57.6% and 24.0%, 33.9% and 57.6% respectively of all casualties in these collisions.

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* A major injury is one which results in the victim being admitted to hospital. This includes persons admitted for observation only.

** A minor injury is one which results in the victim going to hospital and being treated in the emergency room and released.

*** A minimally injured person is one who may have received minor abrasions or bruises or complains of pain but who chooses not to seek medical attention.

School bus passengers accounted for the largest percentage of pupil casualties (53.4%*, 66.3* and 61.6* during 1982-83, 1983-84 and 1984-85 respectively), and were followed by school bus drivers (14.6%, 18.1% and 23.0%) and pedestrians, most of whom were students (13.8%, 13.6% and 14.6%).

During the three year period being studied, four school bus drivers were killed - two in 1982-83 and one during each subsequent school year. Five school bus passengers were killed in 1982-83, while none were killed in 1983-84 and one was fatally injured in 1984-85. Pedestrians (those hit by the school bus in the vehicle loading zone) accounted for the largest number of fatalities each year - five in 1982-83, four in 1983-84 and six in 1984-85. Pedestrians also sustained the largest percentage of major injuries - 3.6%, 3.3% and 4.4% of all casualties respectively.

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* The large difference in the number of school bus passenger casualties between 1982-83 and the latter two academic years was probably the result of incomplete reporting of victim data during 1982-83. In 1982-83, 18.2% of victims killed or injured inside the school bus or outside the vehicle in the school bus loading zone were classified as 'unspecified' - that is, it was not clear whether these victims were school bus drivers, passengers or pedestrians - while the corresponding figures for the 1983-84 and 1984-85 academic years were 2.0% and 0.8% respectively.

Very few school bus passengers sustained major injuries. The figures for the years in question were 2.9%. 3.5% and 1.5% of all casualties. In actual numbers, 20, 19 and 8 school bus passengers were injured seriously enough in road accidents during 1982-83 to 1984-85 to require admission to hospital.

The majority of school bus occupant casualties were minor (34.1%, 36.6% and 38.8%) or minimal (15.6%, 25.3% and 21.1%) injuries to passengers.

4.11 & 4.12 School Buses Involved in Rollover Accidents and Resulting Occupant Casualties - Tables B11 and B12

From 1982-83 to 1984-85, relatively few school buses were involved in rollover accidents (11, 15 and 13 respectively). Three of these accidents resulted in fatalities to school bus occupants. During 1982-83, two school buses which overturned resulted in three occupant fatalities - a school bus driver and two passengers, all of whom were ejected from the vehicles. In 1984-85, a passenger died in a rollover accident from injuries suffered inside the school bus.

Although 21 of the 39 school buses which overturned during this three year period resulted in injuries to occupants, only one school bus passenger sustained major injuries while the remaining occupants received minor (54) or minimal (26) injuries.

4.13 Other Vehicle Occupant and Pedestrian Casualties by Injury Severity - Table B13

During the same three year period, the number of other vehicle occupant and pedestrian casualties were 437, 504 and 471 respectively. As expected, drivers (51.9%, 56.9% and 59.2%) and passengers (33.9%, 31.2% and 29.1%) of other vehicles comprised the vast majority of victims other than school bus occupants who were killed or injured in road accidents involving school buses. Bicyclists (4.6%, 3.6% and 3.4%), motorcycles (2.7%, 3.0% and 5.1%), and pedestrians hit by other vehicles in the bus loading zone (4.3%, 2.8% and 3.0%) accounted for the remaining classes of victims of school bus collisions.

Drivers and passengers of other vehicles accounted for almost all fatal injuries during the three years in question - two of four in 1982-83, twelve of fourteen in 1983-84 and all five in 1984-85. Drivers and passengers of other vehicles involved in collisions with school buses also experienced the majority of major, minor and minimal injuries.

A total of 19, 14 and 14 pedestrians were killed or injured during 1982-83 to 1984-85 after being hit by a vehicle other than the school bus in the bus loading zone. Of these victims, two student pedestrians were killed (in 1982-83), nine sustained major injuries (two in 1982-83, one in 1983-84 and six in 1984-85). The remaining victims sustained minor, minimal or unspecified injuries - 15 in 1982-83, 13 in 1983-84 and 8 in 1984-85.

It is interesting to note that most pedestrians were killed or injured by school buses and not by other vehicles. As already stated, the number of pedestrians killed or injured by other vehicles was 19, 14 and 14 respectively for the three year period being examined while the corresponding pedestrian casualty figures which resulted from collisions with school buses were 96, 74 and 77 respectively during the same period.

4.14 Pedestrians Killed/Injured in Collisions with School Buses by Injury Severity and Pedestrian Action - Table B14

Although the numbers in each cell were quite small when examining pedestrian casualties by injury severity level and pedestrian action preceding collisions, some general observations can be made.

The most frequently noted pedestrian actions among those killed when hit by school buses during 1982-83 - 1984-85 were getting on or off school buses followed by 'crossing intersections', 'running onto roadways' and 'walking on the shoulder of the road'.

The most often noted actions among pedestrians who sustained major, minor and minimal injuries (from accident reports where this information was recorded) were 'crossing intersections or roadways with or without the right of way', 'playing, walking or running on roadways' and 'getting on or off the school buses'.

It is worth mentioning again that pedestrians hit by school buses accounted for a large percentage of total fatalities and major injuries among all victims of school bus collisions. Within their own victim class, 31.2%, 29.7% and 37.7% respectively of all pedestrians hit by school buses during 1982-83 to 1984-85 sustained fatal or major injuries. Most of these seriously injured pedestrians were students. In actual numbers, 30, 22 and 29 pedestrians suffered fatal or major injuries during the three school years in question.

4.15 Pedestrians Killed/Injured in Collisions with Other Vehicles by Injury Severity and Pedestrian Action - Table B15

As previously noted, the number of pedestrians killed or injured when hit by other vehicles, while crossing roads to get on or after getting off of school buses, were very few. Yet despite the limited number of casualties, pedestrians who were hit by other vehicles and subsequently died or were injured were hit most often while engaged in the same activities as pedestrians hit by school buses - 'crossing roadways or intersections' or 'getting on or off of school buses'.

4.16 Pedestrians Killed/Injured in Collisions with School Buses by Injury Severity and Age Groups - Table B16

The majority of pedestrians who were killed or injured when struck by school buses in the vehicle loading zone were students. During the three school years examined, students in the 5-9 year old age group were most often involved in collisions with school buses (30.2%, 33.8% and

46.8% from 1982-83 to 1984-85 respectively). Five of the seven fatally injured student pedestrians, whose ages were specified on accident reports, were in the 5-9 year old age group. Also, more pedestrians in this age group suffered major injuries than any other age group of pedestrian casualties. The figures for the three years in question were 10, 7 and 9 respectively. Although no 10-14 year old student pedestrians were killed, several did suffer major injuries when hit by school buses (9, 5 and 2 during the three years concerned).

It is of interest to note that during this three year period 19.8%, 35.1% and 9.1% respectively of pedestrians struck by school buses in the vehicle loading zone were not students.

4.17 Pedestrians Killed/Injured in Collisions with Other Vehicles by Injury Severity and Age Groups - Table B17

Although victim age information was not available for most pedestrian casualties who were struck by other vehicles, the majority of victims whose ages were specified in accident reports were in the 5-9 year age category.

Of the two fatally injured pedestrians, both of whom died in the 1982-83 academic year, one was in the 5-9 year old age category, and the other in the 10-14 year old age group.

4.18 School Bus Drivers Involved in Collisions by Accident Severity and Driver Action - Table B18

In fatal road conditions where driver action was specified, most school bus operators were driving properly at the time of collision involvement (11 of 14 in 1982-83, 8 of 9 in 1983-84 and 1 of 2 in 1984-85).

School bus drivers apparently committed driving infractions in five fatal road accidents during this three year period. 'Driving too fast for road conditions/speeding' (2), 'failing to yield the right of way' (2) and lost control/ran off road' (1) were the apparent driving infractions committed by these drivers.

The majority of school bus drivers involved in personal injury and property damage collisions were also driving properly when they were involved in collisions. The most frequently reported driving infractions among school bus drivers involved in injury producing accidents were 'failure to yield the right of way' (2.4%, 2.1% and 2.9%), 'following too closely' (0.7%, 0.7% and 1.0%) and 'lost control/ran off road' (0.6%, 0.6% and 0.9%). The most often reported driving infractions among school bus drivers involved in property damage collisions during the three academic years in question were 'failure to yield the right of way' (7.0%, 5.9% and 6.7%) followed by 'improper turn' (4.2%, 4.7% and 4.2%) and 'lost control/ran off road' (3.4%, 3.4% and 3.1%).

It should be mentioned that driver action was left unspecified for a large percentage of collisions, and in these instances it could probably be assumed that no driving infractions were committed.

4.19 Drivers of Other Vehicles Involved in Collisions with School Buses by Accident Severity and Driver Action - Table B19

In fatal collisions where driver action information was specified, the majority of drivers of other vehicles who were involved in road accidents with school buses committed driving infractions. During 1982-83 and 1983-84, 4 of 10 and 4 of 14 drivers respectively were judged to be driving properly according to police accident reports. The remaining drivers involved in fatal collisions committed infractions with the most notable being 'driving too fast for road conditions/speeding' (3) in 1982-83 and 1983-84 (7) and 'following too closely' (3) in 1984-85.

Like school bus drivers, the majority of drivers of other vehicles who were involved in personal injury and property damage accidents with school buses were 'driving properly' at the time of collision.

The most frequently reported infractions among other drivers involved in injury producing collisions with school buses from 1982-83 to 1984-85 were 'driving too fast for road conditions/speeding' (2.1%, 1.8% and 2.1% respectively of all other drivers involved in collisions followed by 'failure to yield the right of way' (1.5%, 1.4% and 1.5%) and 'lost control/ran off road' (1.2%, 1.7% and 1.5%).

Drivers of other vehicles who were involved in property damage accidents with school buses and who committed driving infractions usually 'failed to yield the right of way' (5.1%, 6.4% and 5.5%), were 'following too closely' (4.5%, 3.6% and 4.7%) or were 'driving too fast for road conditions or speeding' (3.3%, 4.1% and 3.1%).

4.20 Vehicles Involved in School Bus Collisions by Vehicle to Vehicle Configuration and Accident Severity - Table B20

During the three academic years from 1982-83 to 1984-85, 15 school buses were involved in single vehicle fatal collisions. Twelve of these road accidents resulted in pedestrian fatalities, with three resulting in occupant fatalities (one driver and two passengers). During each of the three school years examined, approximately 10% of all reportable accidents involving school buses were single vehicle collisions. 4.0%, 4.0% and 3.5% respectively of all these single vehicle collisions during the years in question resulted in injuries, while 5.9%, 3.1% and 4.2% respectively resulted in property damage only.

As expected when multi-vehicle collisions occurred, cars were the vehicle type most often involved in road accidents with school buses. Collisions involving these two vehicle types resulted in the majority of personal injury and property damage accidents - 9.4%, 8.5% and 10.5% and 51.4%, 55.7% and 57.1% respectively of all school bus collisions - which occurred from 1982-83 to 1984-85.

Trucks involved in injury producing and property damage collisions with school buses accounted for 2.9%, 2.9% and 3.2% and 11.1%, 13.9% and 13.4% respectively of all multi-vehicle collisions involving school buses during this period.

School buses were not involved in road accidents with other school buses very often. From 1982-83 to 1984-85, 1.2%, 0.8% and 0.9% respectively of all school bus accidents involved two school buses.

4.21 School Buses Involved in Collisions by Accident Severity and Vehicle Manoeuvre - Table B21

The vast majority of school buses involved in fatal road accidents were 'going straight' at the time of collision. School buses were also 'going straight' when most personal injury and property damage collisions occurred (10.8%, 9.9% and 11.1% and 31.3%, 34.5% and 30.6% respectively of all school buses involved in reportable accidents). 'Merging' and 'turning left' were the next two most often noted school bus manoeuvres preceding personal injury and property damage collisions. It is of interest to note that school buses involved in property damage accidents were 'overtaking' other vehicles at the time of collision (3.9%, 8.4% and 8.1% respectively from 1982-83 to 1984-85) almost as often as 'merging' (10.7%, 10.8% and 11.3%) and 'turning left' (9.9%, 9.8% and 9.5%). This phenomenon was not observed for personal injury accidents.

4.22 Other Vehicles Involved in Collisions with School Buses by Accident Severity and Vehicle Manoeuvre - Table B22

The majority of other vehicles involved in road accidents with school buses were 'going straight' when the collisions occurred (55.1%, 48.1% and 51.2% respectively). As was the case for school buses, 'merging' and 'turning left' were the two next most often reported vehicle manoeuvres for other vehicles involved in road accidents (14.1%, 13.6% and 13.0% and 6.9%, 5.9% and 5.1% respectively). The percentage of other vehicles that were 'overtaking' vehicles when property damage collisions with school buses occurred were somewhat lower than the figures observed for school buses (4.5%, 4.6% and 3.6%).

4.23 Apparent Condition of School Bus Involved in Collisions by Accident Severity - Table B23

Vehicle defects were observed in very few school buses involved in road accidents from 1982-83 to 1984-84. During this period, only one school bus was involved in a fatal collision (1983-84) in which a vehicle defect was reported. The most often reported vehicle defect found in school buses involved in personal injury and property damage collisions was defective brakes. During the three academic years in question, only 0.7%, 0.2% and 0.7% respectively of all school buses involved in injury producing and property damage collisions combined had defective brakes.

5. Discussion

The information presented in this study has shown that during the three academic years from 1982-83 to 1984-85, approximately 36,500 school buses carried almost two million pupils to and from school and travelled about 3.6 million kilometres each school day. Given the number of school buses on the road and total kilometres travelled each school day, road accidents involving school buses were probably inevitable. During the 1982-83 to 1984-85 academic years, 2692, 3281 and 2945 school bus accidents occurred. However, the vast majority of these collisions (approximately 80% each academic year) resulted in property damage only. Of the remaining collisions, very few resulted in fatalities or major injuries to school bus occupants. During the three years in question, six student passengers were killed - five in 1982-83 and one in 1984-85, and four school bus drivers were fatally injured - two in 1982-83, one in 1983-84 and one in 1984-85. During these three academic years, 20, 19 and 8 student passengers and 9, 6 and 7 school bus drivers suffered major injuries. All other school bus occupant injuries were of the minor or minimal variety: 348, 343 and 315 school bus occupants received minor or minimal injuries during the three respective years in question.

The overall safety performance of school buses can be further illustrated by comparing the relative risk of school bus occupants being injured versus the likelihood of all motor vehicle occupants being injured per occupant-kilometre of travel. During the three years in question, the number of school bus occupant casualties per million vehicle-kilometres travelled were 0.72, 0.68 and 0.64 respectively while the corresponding figures for all motor

vehicle occupants were 1.0, 1.05 and 1.17. However, by assuming that school buses transported an average of twenty occupants per vehicle while all motor vehicles carried an average of two occupants per vehicle, the risk of motor vehicle occupants being injured per million occupant-kilometres travelled would have been 13.8, 15.4 and 18.3 times greater than for school bus occupants during the years in question. These school bus occupant casualty figures clearly indicate that school buses are very safe vehicles for transporting students to and from school and provide occupants with a safe environment when collisions do occur.

The results also showed that more students were killed or seriously injured as pedestrians when hit by school buses in the vehicle loading zone than as passengers inside school buses. The majority of fatally injured student pedestrians, where victim ages were specified, were in the 5-9 year age category. The number of students who died after being involved in collisions with school buses for the years 1982-83 to 1984-85 were four, four and six respectively while the corresponding figures for seriously injured student pedestrians were 21, 14 and 14.

The results of this study also showed that in fatal accidents where driver action information was specified, most school bus drivers were 'driving properly' when the collisions occurred. So, presumably school bus drivers were not at fault in all collisions which resulted in fatal injuries to student pedestrians.

Conversely, the majority of drivers of other vehicles involved in fatal road accidents with school buses or student pedestrians (two students died when struck by other vehicles during this three year period) committed driving infractions. 'Driving too fast for road conditions/speeding' (3 in 1982-83 and 7 in 1983-84) and 'following too closely' (3 in 1984-85) were the most frequently reported driving infractions.

6. Conclusions

The examination of three successive years of school bus accident data, from 1982-83 to 1984-85, has clearly demonstrated that school buses are relatively safe vehicles for transporting children to and from school. Although an average of nearly 3000 school bus accidents occurred during each academic year examined, very few collisions resulted in major or fatal injuries to school bus occupants.

Although the number of student pedestrians killed each academic year in the school bus loading zone accounted for fewer than one percent of all pedestrian fatalities that occurred on Canadian roadways during the years in question, they still represented the majority of students who died each year in collisions involving school buses.

APPENDICES - Tables and Figures

Table A1

Elementary/Secondary School Pupil Enrolment and School Bus Transportation Figures
Canada - 1982-83 - 1984-85

Academic Year

Province	1982-83			1983-84			1984-85		
	Pupils (A) Enrolled	Pupils (B) Bused	B ÷ A (%)	Pupils (A) Enrolled	Pupils (B) Bused	B ÷ A (%)	Pupils (A) Enrolled	Pupils (B) Bused	B ÷ A (%)
Nfld.	142,628	88,200	61.8	147,713	83,000	56.2	145,148	82,000	56.5
P.E.I.	25,743	19,077	74.1	25,495	19,206	75.3	25,192	19,274	76.5
N.S.	179,886	87,000(E)	48.4	177,859	87,000(E)	48.9	175,168	87,000	49.7
N.B.	147,878	101,893	68.9	146,045	100,714	69.0	143,416	100,714(E)	70.2
Que.	1,075,190	598,311	55.4	1,006,681	597,473	59.4	1,056,445	599,778	56.8
Ont.	1,789,820	603,783	33.7	1,774,453	602,351	33.9	1,759,451	621,718	35.3
Man.	200,622	64,197	32.0	199,912	61,921	31.0	199,474	63,466	31.8
Sask.	201,417	59,285(E)	29.4	201,242	59,285	29.5	201,892	59,285(E)	29.4
Alta.	448,652	166,000(E)	37.0	448,973	166,000	37.0	446,475	158,282	35.5
B.C.	500,482	129,347	25.8	497,452	123,289	24.8	491,264	116,730	23.8
Canada	4,712,318	1,909,093	40.5	4,703,454	1,900,239	40.4	4,643,925	1,908,247	41.1

(E) Estimate

Table A2

School Bus Travel Figures - Canada - 1982-83 - 1984-85

Academic Year

Province	1982-83				1983-84				1984-85			
	School Buses	Average Pupils Carried Per Bus	Estimated Annual Km Travelled*	Average Daily Km Per Bus	School Buses	Average Pupils Carried Per Bus	Estimated Annual Km Travelled*	Average Daily Km Per Bus	School Buses	Average Pupils Carried Per Bus	Estimated Annual Km Travelled*	Average Daily Km Per Bus
Nfld.	1,020	78.6	6,142,000	32.5	1,030	80.6	6,142,000	32.2	1,050	78.1	6,105,000	31.4
P.E.I.	317	60.1	4,334,710	73.9	314	61.2	4,380,615	75.4	313	61.6	4,333,780	74.8
N.S.	1,300(E)	66.9	24,975,000(E)	103.8	1,300	66.9	24,975,000	103.8	1,300(E)	66.9	24,975,000(E)	74.9
N.B.	1,125	90.6	21,978,000(E)	105.6	1,119	90.9	21,978,000	106.2	1,120	89.9	21,978,000(E)	106.1
Que.	8,461	70.7	157,392,450	100.6	8,521	70.1	160,044,980	101.5	8,680	69.1	164,238,380	102.3
Ont.	13,786	43.8	218,693,680	85.7	13,938	43.2	228,766,190	88.7	15,052	41.3	243,476,840	87.4
Man.	1,849	34.7	41,834,000	122.3	1,926	32.2	45,794,530	128.5	1,981	32.0	45,052,000	128.5
Sask.	2,448(E)	24.2	66,996,270(E)	147.9	2,448(E)	24.2	66,996,270(E)	147.9	2,448	24.2	66,996,270	147.9
Alta.	3,852(E)	43.1	88,255,175(E)	123.8	3,852(E)	43.1	88,255,175(E)	123.8	3,852	41.1	88,255,175	123.8
B.C.	1,183	109.3	28,560,485	130.5	1,167	105.1	28,044,520	129.9	1,217	95.9	29,623,495	128.6
Canada	35,341	54.0	659,161,770	100.8	35,615	53.4	675,377,280	98.8	37,013	51.6	695,033,940	101.5

* Annual kilometres travelled were based on the 185 school days of the academic year.
(E) Estimate

Table B1

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Number of Collisions by Accident Severity

Accident Severity	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Fatal	19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL	2692		3281		2945	

Table B2

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Persons Killed or Injured in Road Accidents Involving School Buses by Road User Class

Road User Class	Injury Severity	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
School Bus Drivers	Killed	2	0.2	1	0.1	1	0.1
	Injured	100	8.8	98	9.3	120	12.0
School Bus Passengers	Killed	5	0.4	-		1	0.1
	Injured	368	32.4	362	34.5	323	32.4
Pedestrians	Killed	7	0.6	4	0.4	6	0.6
	Injured	108	9.5	84	8.0	85	8.5
Other Vehicle Victims	Killed	6	0.5	14	1.3	6	0.6
	Injured	539	47.5	487	46.4	455	45.6
Total Victims	Killed	20		19		14	
	Injured	1115		1031		983	

Table B3

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Time of Collision

Accident Severity	Time of Accident	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Fatal	07 a.m - 11 a.m	11	0.4	7	0.2	5	0.2
	11 a.m - 03 p.m	-	-	-	-	2	-
	03 p.m - 07 p.m	8	0.3	11	0.3	5	0.2
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	03 a.m - 07 a.m	1	-	4	0.1	4	0.1
	07 a.m - 11 a.m	181	6.7	230	7.0	265	9.0
	11 a.m - 03 p.m	107	4.0	96	2.9	100	3.4
	03 p.m - 07 p.m	214	8.0	230	7.0	236	8.0
	07 p.m - 11 p.m	15	0.6	16	0.5	8	0.3
	Unspecified	6	0.2	8	0.3	9	0.3
		524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	03 a.m - 07 a.m	13	0.5	18	0.5	19	0.6
	07 a.m - 11 a.m	848	31.5	1056	32.2	930	31.6
	11 a.m - 03 p.m	458	17.0	571	17.4	444	15.1
	03 p.m - 07 p.m	753	28.0	956	29.1	838	28.4
	07 p.m - 11 p.m	25	0.9	48	1.5	40	1.4
	Unspecified	52	1.9	30	1.0	40	1.4
			(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B4

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Month of Occurrence

Accident Severity	Month	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Fatal	September	3	0.1	1	-	1	-
	October	1	-	3	0.1	-	-
	November	-	-	-	-	1	-
	December	2	0.1	6	0.2	3	0.1
	January	3	0.1	2	0.1	3	0.1
	February	1	-	-	-	-	-
	March	1	-	1	-	2	0.1
	April	-	-	3	0.1	1	-
	May	7	0.3	1	-	-	-
	June	1	-	1	-	1	-
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	September	48	1.8	59	1.8	44	1.5
	October	49	1.8	65	2.0	53	1.8
	November	58	2.2	69	2.1	73	2.5
	December	63	2.3	71	2.2	54	1.8
	January	62	2.3	89	2.7	74	2.5
	February	42	1.6	67	2.0	96	3.3
	March	76	2.8	43	1.3	44	1.5
	April	35	1.3	22	0.7	54	1.8
	May	46	1.7	44	1.3	65	2.2
	June	45	1.7	55	1.7	65	2.2
		524	(19.5)	584	(17.8)	622	(21.1)

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Table B4 Continued

Accident Severity	Month	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Property damage	September	170	6.3	198	6.0	157	5.3
	October	202	7.5	184	5.6	188	6.4
	November	279	10.3	380	11 6	224	7.6
	December	255	9.5	479	14.6	293	10.0
	January	307	11.4	443	13.5	368	12.5
	February	188	7.0	281	8.6	375	12.7
	March	242	9.0	280	8.5	225	7.6
	April	170	6.3	114	3.5	189	6.4
	May	188	7.0	183	5.6	167	5.7
	June	148	5.5	137	4.2	125	4.3
		2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B5

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Light Condition

Accident Severity	Light Condition	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Day	18	0.7	15	0.5	10	0.3
	Dark	-	-	1	-	1	-
	Dawn	1	-	1	-	-	-
	Dusk	-	-	1	-	1	-
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	Day	477	17.7	536	16.3	576	19.5
	Dark	31	1.1	30	0.9	28	1.0
	Dawn	7	0.3	4	0.1	4	0.1
	Dusk	11	0.4	14	0.4	14	0.5
		524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	Day	1942	72.1	2386	72.7	2122	72.0
	Dark	118	4.4	170	5.2	105	3.6
	Dawn	24	0.9	30	0 9	24	0.8
	Dusk	57	2.1	83	2.5	52	1.8
	Unspecified	8	0.3	10	0.4	8	0.3
		2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B6

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Place of Occurrence

Accident Severity	Accident Place	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Rural	13	0.5	12	0.3	4	0.1
	Urban	6	0.2	6	0.2	8	0.3
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	Rural	190	7.1	211	6.4	243	8.2
	Urban	308	11.4	358	10.9	367	12.5
	Unspecified	26	1.0	15	0.5	12	0.4
		524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	Rural	523	19.4	618	18.8	548	18.6
	Urban	1428	53.0	1974	60.2	1650	56.0
	Unspecified	198	7.4	87	2.7	113	3.9
		2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B7

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Road Surface Type

Accident Severity	Road Surface Type	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Fatal	Paved	18	0.7	18	0.5	12	0.4
	Unpaved	1	-	-	-	-	-
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	Paved	483	18.0	533	16.2	556	18.9
	Unpaved	38	1.4	48	1.5	60	2.0
	Unknown	3	0.1	3	0.1	6	0.2
		524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	Paved	1946	72.2	2479	75.6	2085	70.8
	Unpaved	182	6.8	186	5.7	182	6.2
	Unknown	21	0.8	14	0.4	44	1.5
		2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B8

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Road Surface Condition

Accident Severity	Road Surface Condition	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Dry	12	0.5	10	0.3	5	0.2
	Wet	3	0.1	4	0.1	4	0.1
	Snow/ice/slush	4	0.1	4	0.1	3	0.1
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	Dry	261	9.7	264	8.0	299	10.1
	Wet	138	5.2	128	3.9	140	4.7
	Gravel/sand	4	0.1	4	0.1	5	0.2
	Snow/ice/slush	121	4.5	186	5.7	176	6.0
	Unspecified	-	-	2	0.1	2	0.1
		524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	Dry	911	33.8	984	30.0	960	32.6
	Wet	498	18.5	509	15.5	410	13.9
	Gravel/sand	13	0.5	16	0.5	16	0.5
	Snow/ice/slush	718	26.7	1155	35.2	912	31.0
	Unspecified	9	0.3	17	0.5	13	0.5
		2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B9

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Accident Severity by Weather Condition

Accident Severity	Weather	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Clear	13	0.5	17	0.5	10	0.3
	Fog/dust	1	-	1	-	-	-
	Rain	1	-	-	-	2	0.1
	Snow	4	0.2	-	-	-	-
		19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	Clear	375	13.9	462	14.1	466	15.8
	Fog/dust	23	0.9	24	0.7	27	0.9
	Rain	85	3.2	36	1.1	51	1.7
	Snow	40	1.5	54	1.7	74	2.5
	Unspecified	1		8	0.2	4	0.2
		524	(19.5)	584	(17.8)	622	(21.1)
Property Damage	Clear	1613	59.9	2029	61.9	1805	61.3
	Fog/dust	27	1.0	44	1.4	36	1.2
	Rain	272	10.1	195	5.9	125	4.3
	Snow	231	8.6	384	11.7	315	10.7
	Unspecified	7	0.2	27	0.8	30	1.0
		2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL		2692		3281		2945	

Table B10

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

School Bus Occupant and Pedestrian* Casualties by Injury Severity

Victim Class	Injury Severity Level	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Drivers	Fatal	2	0.3	1	0.2	1	0.2
	Major	9	1.3	6	1.1	7	1.3
	Minimal	41	5.9	36	6.6	44	8.4
	Minor	43	6.2	53	9.7	66	12.5
	Unspecified	6	0.9	3	0.5	3	0.6
		102	(14.6)	99	(18.1)	121	(23.0)
Passengers	Fatal	5	0.7	-	-	1	0.2
	Major	20	2.9	19	3.5	8	1.5
	Minimal	109	15.6	138	25.3	111	21.1
	Minor	238	34.1	200	36.6	204	38.8
	Unspecified	1	0.1	5	0.9	-	-
		373	(53.4)	362	(66.3)	324	(61.6)
Pedestrians	Fatal	5	0.7	4	0.8	6	1.1
	Major	25	3.6	18	3.3	23	4.4
	Minimal	11	1.6	11	2.0	13	2.5
	Minor	35	5.0	41	7.5	31	5.9
	Unspecified	20	2.9	-	-	4	0.8
		96	(13.8)	74	(13.6)	77	(14.6)

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Table B10 Continued

Victim Class	Injury Severity Level	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Unspecified	Fatal	4	0.6	-	-	1	0.2
	Major	6	0.9	1	0.2	-	-
	Minimal	6	0.9	-	-	-	-
	Minor	96	13.8	9	1.6	2	0.4
	Unspecified	15	2.3	1	0.2	1	0.2
		127	(18.2)	11	(2.0)	4	(0.8)
TOTAL		698		546		526	

* The pedestrian casualties in this table were apparently struck by school buses in the loading zone.

Table B11

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

School Buses Involved in Rollover Accidents by Accident Severity

Accident Severity	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Fatal	2	(18.2)	-		1	(7.7)
Personal Injury	5	(45.4)	9	(60.0)	7	(53.8)
Property Damage	4	(36.4)	6	(40.0)	5	(38.5)
TOTAL	11		15		13	

Table B12

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

School Bus Occupant Casualties Resulting From Rollover Accidents by Injury Severity

Victim Class	Injury Severity	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Drivers	Killed	1	3.7	-		-	
	Minimal	-		1	3.2	-	
	Minor	3	11.1	1	3.2	3	11.1
		4	(14.8)	2	(6.4)	3	(11.1)
Passengers	Killed	2	1.6	-		1	3.7
	Major	-		1	3.2		
	Minimal	-		22	71.0	3	11.1
	Minor	21	81.5	6	19.4	20	74.1
		23	(85.2)	29	(93.6)	24	(88.9)
TOTAL		27		31		27	

Table B13

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Other Vehicle Occupants and Pedestrian* Casualties by Injury Severity

Victim Class	Injury Severity	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Bicyclist	Fatal	-	-	1	0.2	-	-
	Major	2	0.4	6	1.2	3	0.6
	Minimal	9	2.1	2	0.4	5	1.1
	Minor	9	2.1	9	1.8	8	1.7
		20	(4.6)	18	(3.6)	16	(3.4)
Drivers	Fatal	1	0.2	9	1.8	5	1.1
	Major	21	4.8	24	4.8	23	4.9
	Minimal	92	21.1	93	18.5	101	21.4
	Minor	112	25.6	158	31.3	150	31.8
	Unspecified	1	0.2	3	0.5	-	-
		227	(51.9)	287	(56.9)	279	(59.2)
Motorcyclist	Fatal	-	-	1	0.2	-	-
	Major	4	0.9	3	0.6	9	1.9
	Minimal	2	0.4	4	0.8	5	1.1
	Minor	6	1.4	7	1.4	10	2.1
		12	(2.7)	15	(3.0)	24	(5.1)

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Table B13 Continued

Victim Class	Injury Severity	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Passenger	Fatal	1	0.2	3	0.6	-	-
	Major	14	3.2	16	3.2	10	2.1
	Minimal	50	11.4	33	6.6	57	12.1
	Minor	79	18.1	104	20.6	70	14.9
	Unspecified	4	0.9	1	0.2	-	-
		148	(33.9)	157	(31.2)	137	(29.1)
Pedestrian	Killed	2	0.4	-	-	-	-
	Major	2	0.4	1	0.2	6	1.3
	Minimal	1	0.2	5	1.0	2	0.4
	Minor	5	1.1	7	1.4	5	1.1
	Unspecified	9	2.1	1	0.2	1	0.2
		19	(4.3)	14	(2.8)	14	(3.0)
Unspecified	Major	-	-	4	0.8	1	-
	Minor	5	1.1	8	1.6	-	-
	Unspecified	6	1.4	1	0.2	-	-
		11	(2.5)	13	(2.6)	1	(0.2)
TOTAL		437		504		471	

* These pedestrians were apparently struck by 'other vehicles' in the school bus loading zone.

Table B14

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Pedestrians Killed/Injured in Collisions With School Buses By Injury Severity and Pedestrian Action

Injury Severity	Pedestrian Action	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Killed	Crossing intersection with no traffic control	1	1.0	-	-	1	1.3
	Getting on/off vehicle	3	3.1	1	1.3		
	Running onto roadway	1	1.0	1	1.3	1	1.3
	On sidewalk/shoulder/median	-	-	1	1.3		
	Crossing intersection without right of way	-	-	-	-	1	1.3
	Unspecified	-	-	1	1.3	3	3.9
		5	(5.2)	4	(5.4)	6	(7.8)
Major	Coming from behind parked vehicle	4	4.2	1	1.3	1	1.3
	Crossing highway/Between intersections	-	-	1	1.3	3	3.9
	Crossing intersection with no traffic control	2	2.1	3	4.1	3	3.9
	Crossing intersection with right of way	4	4.2	1	1.3	1	1.3
	Crossing intersection without right of way	5	5.2	1	1.3	1	1.3
	Getting on/off vehicle	-	-	1	1.3	-	-
	On sidewalk/shoulder/median	-	-	1	1.3	1	1.3
	Playing/walking on roadway	4	4.2	1	1.3	3	3.9
	Running onto roadway	-	-	1	1.3	5	6.5
	Unspecified	6	6.3	7	9.5	5	6.5
		25	(26.0)	18	(24.3)	23	(29.9)

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Table B14 Continued

Injury Severity	Pedestrian Action	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Minimal	Coming from behind parked vehicle	-	-	3	4.1	-	-
	Crossing highway between intersections	1	1.0	-	-	1	1.3
	Crossing intersection with right of way	3	3.1	1	1.3	1	1.3
	On sidewalk/shoulder/median	1	1.0	1	1.3	4	5.2
	Playing/walking on roadway	2	2.1	1	1.3	-	-
	Running onto roadway	3	3.1	2	2.7	2	2.6
	Unspecified	1	1.0	3	4.1	5	6.5
		11	(11.5)	11	(14.9)	13	(16.9)
Minor	Coming from behind parked vehicle	3	3.1	1	1.3	3	3.9
	Crossing highway between intersections	-	-	3	4.1	-	-
	Crossing intersection with no traffic control	1	1.0	-	-	-	-
	Crossing intersection with right of way	7	7.3	3	4.1	3	3.9
	Crossing intersection without right of way	-	-	5	6.7	2	2.6
	Getting on/off vehicle	4	4.2	8	10.8	1	1.3
	On sidewalk/shoulder/median	3	3.1	2	2.7	2	2.6
	Playing/walking on roadway	4	4.2	4	5.4	2	2.6
	Running onto roadway	5	5.2	-	-	2	2.6
	Unspecified	8	8.3	15	20.2	16	20.8
		35	(36.5)	41	(55.3)	31	(40.3)

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Table B14 Continued

Injury Severity	Pedestrian Action	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Unspecified	Crossing highway between intersections	1	1.0	-	-	-	-
	Crossing intersection with no traffic control	1	1.0	-	-	-	-
	Crossing intersection with right of way	3	3.0	-	-	-	-
	Crossing intersection without right of way	1	1.0	-	-	-	-
	Getting on/off vehicle	5	5.2	-	-	-	-
	Playing/walking on roadway	1	1.0	-	-	-	-
	Unspecified	8	8.3	-	-	4	5.2
		20	(20.8)	-	-	4	(5.2)
TOTAL		96		74		77	

Table B15

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Pedestrians* Killed/Injured in Collisions With Other Vehicles By Injury Severity and Pedestrian Action

Injury Severity	Pedestrian Action	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Killed	Getting on/off vehicle	1	5.2	-	-	-	-
	Crossing intersection with right of way	1	5.2	-	-	-	-
		2	(10.5)	-	-	-	-
Major	Crossing intersection with right of way	1	5.2	-	-	1	7.1
	Getting on/off vehicle	-	-	-	-	1	7.1
	Playing/walking on roadway	1	5.2	-	-	-	-
	Running onto roadway	-	-	1	7.1	1	7.1
	Unspecified	-	-	-	-	3	21.4
		2	(10.5)	1	(7.1)	6	(42.9)
Minimal	Crossing highway/Between intersections	-	-	1	7.1	1	7.1
	Crossing intersection with right of way	-	-	1	7.1	-	-
	Running onto roadway					1	7.1
	Unspecified	1	5.2	3	21.4	-	-
		1	(5.2)	5	(35.7)	2	(14.3)

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Table B15 Continued

Injury Severity	Pedestrian Action	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Minor	Coming from behind parked vehicle	-	-	1	7.1	-	-
	Crossing highway/Between intersections	3	15.8	1	7.1	-	-
	Crossing intersection with right of way	-	-	1	7.1	-	-
	Crossing intersection without right of way	-	-	-	-	1	7.1
	Getting on/off vehicle	1	5.2			1	7.1
	Unspecified	1	5.2	4	28.6	3	21.2
		5	(26.3)	7	(50.0)	5	(35.4)
Unspecified	Crossing highway/Between intersections	1	5.2	-	-	-	-
	Crossing intersection with right of way	3	15.8	-	-	1	7.1
	Crossing intersection without right of way	1	5.2	-	-	-	-
	Getting on/off vehicle	1	5.2	-	-	-	-
	Unspecified	3	15.8	1	7.1	-	-
		9	(47.4)	1	(7.1)	1	(7.1)
TOTAL		19		14		14	

Note: These pedestrians were killed/injured by 'other vehicles' in the school bus loading zone.

Table B16

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Pedestrians Killed/Injured in Collisions With School Buses by Injury Severity and Age Groups

Academic Year	Injury Severity	Age Groups 01-04	%	05-09	%	10-14	%	15-19	%	20+	%	Unspecified	%	Total	%
1982-83	Killed	-		3	3.1	-		1	1.0	1	1.0	-		5	(5.2)
	Major	1	1.0	10	10.4	9	9.4	1	1.0	4	4.2	-		25	(26.0)
	Minimal	-		6	6.3	3	3.1	-		2	2.1	-		11	(11.5)
	Minor	1	1.0	9	9.4	4	4.2	5	5.2	12	12.5	4	4.2	35	(36.4)
	Unspecified	1	1.0	1	1.0	4	4.2	8	8.3	-		6	6.2	20	(20.8)
	Total	3	(3.1)	29	(30.2)	20	(20.8)	15	(15.6)	19	(19.8)	10	(10.4)	96	
1983-84	Killed	1	1.4	1	1.4	-		-		-		2	2.7	4	(5.4)
	Major	-		7	9.5	5	6.8	2	2.7	4	5.4	-		18	(24.3)
	Minimal	-		3	4.1	7	9.5	-		1	1.4	-		11	(14.9)
	Minor	-		14	18.9	-		3	4.1	21	28.4	3	4.1	41	(55.4)
	Total	1	(1.4)	25	(33.8)	12	(16.2)	5	(6.8)	26	(35.1)	5	(6.8)	74	
1984-85	Killed	-		1	1.3	-		-		-		5	6.5	6	(7.8)
	Major	-		9	11.7	2	2.6	2	2.6	5	6.5	5	6.5	23	(29.9)
	Minimal	1	1.3	4	5.2	2	2.6	6	7.8	-		-		13	(16.9)
	Minor	-		18	23.4	8	10.4	3	3.9	2	2.6	-		31	(40.3)
	Unspecified	-		4	5.2	-		-		-		-		4	(5.2)
	Total	1	(1.3)	36	(46.8)	12	(15.6)	11	(14.3)	7	(9.1)	10	(13.0)	77	

Table B17

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Pedestrians Killed/Injured in Collisions With Other Vehicles by Injury Severity and Age Groups

Academic Year	Injury Severity	Age Groups 01-04	%	05-09	%	10-14	%	15-19	%	20+	%	Unspecified	%	Total	%
1982-83	Killed	-		1	5.3	1	5.3	-		-		-		2	(10.5)
	Major	-		1	5.3	1	5.3	-		-		-		2	(10.5)
	Minimal	-		1	5.3	-		-		-		-		1	(5.3)
	Minor	1		1	5.3	-		1	5.3	1	5.3	1	5.3	5	(26.3)
	Unspecified	-	5.3	-		-		-		-		9	47.3	9	(47.3)
	Total	1	(5.3)	4	(21.1)	2	(10.5)	1	(5.3)	1	(5.3)	10	(52.6)	19	
1983-84	Major	-		1	7.1	-		-		-		-		1	(7.1)
	Minimal	-		1	7.1	1	7.1	-		1	7.1	1	7.1	4	(28.6)
	Minor	1	7.1	1	7.1	-		3	21.4	-		3	21.4	8	(57.1)
	Unspecified	1	7.1	-		-		-		-		-		1	(7.1)
	Total	2	(14.2)	3	(21.4)	1	(7.1)	3	(21.4)	1	(7.1)	4	(28.6)	14	
1984-85	Major	-		-		-		3	21.4	1	7.1	2	14.3	6	(42.9)
	Minimal	-		2	14.3	-		-		-		-		2	(14.3)
	Minor	-		1	7.1	-		1	7.1	-		3	21.4	5	(35.1)
	Unspecified	-		-		-		-		1	7.1	-		1	(7.1)
	Total	-		3	(21.4)	-		4	(28.6)	2	(14.3)	5	(35.7)	14	

Table B18

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

School Bus Drivers Involved in Collisions by Accident Severity and Driver Action

Accident Severity	Driver Action	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Driving properly	11	0.4	8	0.2	1	-
	Driving too fast for road conditions/speeding	1	-	-	-	1	-
	Fail to yield right-of-way	1	-	1	-	-	-
	Lost control/ran off road	1	-	-	-	-	-
	Unspecified	3	0.1	11	0.3	10	0.3
		17	(0.6)	20	(0.6)	12	(0.4)
Personal Injury	Backing unsafely	1	-	1	-	3	0.1
	Disobey traffic control device	11	0.4	7	0.2	17	0.5
	Driving properly	307	11.6	218	6.6	234	7.9
	Driving too fast for road conditions/speeding	11	0.4	25	0.8	23	0.8
	Fail to yield right-of-way	64	2.4	70	2.1	85	2.9
	Following too closely	19	0.7	22	0.7	30	1.0
	Improper pass/lane change	4	0.2	4	0.1	3	0.1
	Improper turn	11	0.4	15	0.5	11	0.4
	Lost control/ran off road	16	0.6	28	0.9	27	0.9
	Driving in wrong direction	-	-	3	0.1	3	0.1
	Unspecified	105	4.0	222	6.7	198	6.7
		548	(20.7)	615	(18.7)	634	(21.4)

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Table B18 Continued

Accident Severity	Driver Action	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Property Damage	Backing unsafely	118	4.4	137	4.2	106	3.6
	Disobey traffic control device	15	0.6	18	0.6	13	0.4
	Driving properly	989	37.2	644	19.6	573	19.3
	Driving too fast for road conditions/speeding	44	1.6	42	1.3	46	1.6
	Fail to yield right-of-way	186	7.0	195	5.9	200	6.7
	Following too closely	40	1.5	57	1.7	38	1.3
	Improper pass/lane change	20	0.8	18	0.5	4	0.1
	Improper turn	111	4.2	154	4.7	126	4.2
	Lost control/ran off road	89	3.4	113	3.4	92	3.1
	Driving in wrong direction	11	0.4	8	0.2	10	0.3
	Unspecified	467	17.6	1272	38.6	1113	37.5
		2090	(78.7)	2658	(80.7)	2321	(78.2)
TOTAL		2655		3293		2967	

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Drivers of Other Vehicles Involved in Collisions with School Buses by Accident Severity and Driver Action

Accident Severity	Driver Action	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Backing unsafely	1	-	-	-	-	-
	Driving properly	4	0.1	4	0.1	-	-
	Driving too fast for road conditions/speeding	3	0.1	7	0.2	-	-
	Fail to yield right-of-way	-	-	1	-	1	-
	Following too closely	1	-	-	-	3	0.1
	Lost control/ran off road	-	-	2	0.1	-	-
	Driving in wrong direction	1	-	-	-	-	-
	Unspecified	7	0.3	8	0.2	-	-
		17	(0.6)	22	(0.7)	4	(0.1)
Personal Injury	Backing unsafely	-	-	1	-	1	-
	Disobey traffic control device	23	0.9	29	0.9	25	0.9
	Driving properly	202	7.5	181	5.4	198	6.7
	Driving too fast for road conditions/speeding	56	2.1	59	1.8	60	2.1
	Fail to yield right-of-way	41	1.5	47	1.4	44	1.5
	Following too closely	37	1.4	20	0.6	41	1.4
	Improper pass/lane change	8	0.3	5	0.1	4	0.1
	Improper turn	9	0.3	5	0.1	4	0.1
	Lost control/ran off road	32	1.2	59	1.7	43	1.5
	Driving in wrong direction	3	0.1	7	0.2	1	-
	Unspecified	84	3.1	160	4.8	182	6.2
		495	(18.4)	573	(17.0)	603	(20.5)

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Table B19 Continued

Accident Severity	Driver Action	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Property Damage	Backing unsafely	40	1.5	64	1.9	29	1.0
	Disobey traffic control device	57	2.1	52	1.5	58	2.0
	Driving properly	877	32.6	586	17.4	470	16.0
	Driving too fast for road conditions/speeding	88	3.3	137	4.1	92	3.1
	Fail to yield right-of-way	138	5.1	214	6.4	161	5.5
	Following too closely	121	4.5	121	3.6	138	4.7
	Improper pass/lane change	33	1.2	21	0.6	34	1.2
	Improper turn	32	1.2	48	1.4	44	1.5
	Lost control/ran off road	7	0.3	283	8.4	235	8.0
	Driving in wrong direction	12	0.4	8	0.2	12	0.4
	Unspecified	771	28.8	1238	36.8	1055	35.9
		2176	(81.0)	2772	(82.3)	2328	(79.3)
TOTAL		2688		3367		2935	

Table B20

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Vehicles Involved in School Bus Collisions by Vehicle to Vehicle Configuration and Accident Severity

Accident Severity	Vehicle to Vehicle Configuration: Vehicle 1 Type	Vehicle 2 Type	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	School Bus	(Nil)	6	0.2	1	-	8	0.3
		Bicycle	-	-	1	-	-	-
		Car	4	0.2	10	0.3	2	0.1
		Heavy truck	1	-	-	-	-	-
		Other	-	-	-	-	1	-
		Tractor trailer	1	-	-	-	-	-
		Unspecified truck	4	0.2	2	0.1	1	-
	Unspecified vehicles		3	0.1	4	0.1	-	-
			19	(0.7)	18	(0.5)	12	(0.4)
Personal Injury	School Bus	(Nil)	108	4.0	130	4.0	103	3.5
		Bicycle	22	0.8	24	0.7	19	0.7
		Bus	4	0.2	5	0.2	5	0.2
		Car	253	9.4	279	8.5	310	10.5
		Heavy truck	4	0.2	7	0.2	7	0.2
		Light truck/van	38	1.4	57	1.7	63	2.1
		Motorcycle	15	0.6	8	0.2	25	0.9
		Other	-	-	5	0.2	6	0.2
		School bus	7	0.3	11	0.3	13	0.4
		Tractor trailer	10	0.4	7	0.2	15	0.5
		Unspecified truck	23	0.9	26	0.8	11	0.4
	Unspecified vehicles		40	1.5	25	0.8	45	1.5
			524	(19.5)	584	(17.8)	622	(21.1)

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Table B20 Continued

Accident Severity	Vehicle to Vehicle Configuration: Vehicle 1 Type	Vehicle 2 Type	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Property Damage	School Bus	(Nil)	160	5.9	103	3.1	124	4.2
		Bicycle	6	0.2	1	-	4	0.1
		Bus	9	0.3	23	0.7	15	0.5
		Car	1383	51.4	1826	55.7	1681	57.1
		Heavy truck	18	0.7	29	0.9	29	1.0
		Light truck/van	151	5.6	168	5.1	158	5.4
		Motorcycle	7	0.3	8	0.2	5	0.2
		Other	21	0.8	33	1.0	19	0.6
		School bus	24	0.9	17	0.5	15	0.5
		Tractor trailer	12	0.4	35	1.1	21	0.7
		Unspecified truck	119	4.4	223	6.8	185	6.3
	Unspecified vehicles		239	8.9	213	6.5	55	1.9
			2149	(79.8)	2679	(81.7)	2311	(78.5)
TOTAL			2692		3281		2945	

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

School Buses Involved in Collisions by Accident Severity and Vehicle Manoeuvre

Accident Severity	Vehicle Manoeuvre	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Going straight	12	0.5	12	0.4	8	0.3
	Merging	-	-	1	-	1	-
	Parked	1	-	1	-	1	-
	Turning left	1	-	3	0.1	-	-
	Turning right	-	-	-	-	1	-
	Unspecified	3	0.1	3	0.1	1	-
		17	(0.6)	20	(0.6)	12	(0.4)
Personal Injury	Changing lanes	3	0.1	5	0.2	7	0.2
	Going Straight	287	10.8	327	9.9	329	11.1
	Making U turn	-	-	-	-	1	-
	Merging	72	2.7	82	2.5	85	2.9
	Overtaking	7	0.3	11	0.3	10	0.3
	Parked	13	0.5	9	0.3	22	0.8
	Skidding/swerving	-	-	3	0.1	-	-
	Slowing/stopped	4	0.1	8	0.2	5	0.2
	Turning left	61	2.3	66	2.0	65	2.2
	Turning right	23	0.9	22	0.7	25	0.8
	Unspecified	78	3.0	82	2.5	85	2.9
		548	(20.7)	615	(18.7)	634	(21.4)

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Table B21 Continued

Accident Severity	Vehicle Manoeuvre	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Property Damage	Changing lanes	45	1.7	31	1.0	17	0.6
	Going Straight	832	31.3	1137	34.5	908	30.6
	Making U turn	5	0.2	1	-	5	0.2
	Merging	285	10.7	354	10.8	335	11.3
	Overtaking	236	8.9	276	8.4	240	8.1
	Parked	52	2.0	34	1.0	56	1.9
	Skidding/swerving	1	-	-	-	1	-
	Slowing/stopped	20	0.8	24	0.7	27	0.9
	Turning left	262	9.9	322	9.8	282	9.5
	Turning right	159	6.0	211	6.4	209	7.0
	Unspecified	193	7.3	268	8.1	241	8.1
		2090	(78.7)	2658	(80.7)	2321	(78.2)
TOTAL		2655		3293		2967	

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Other Vehicles Involved in Collisions With School Buses by Accident Severity and Vehicle Manoeuvre

Accident Severity	Vehicle Manoeuvre	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Fatal	Going straight	14	0.5	11	0.3	2	0.1
	Merging	-	-	4	0.1	1	-
	Overtaking	1	-	-	-	-	-
	Parked	-	-	1	-	-	-
	Slowing/stopped	-	-	3	0.1	-	-
	Turning left	-	-	3	0.1	-	-
	Unspecified	2	0.1	-	-	1	-
		17	(0.6)	22	(0.7)	4	(0.1)
Personal Injury	Changing lanes	4	0.1	4	0.1	7	0.2
	Going Straight	332	12.4	355	10.6	383	13.1
	Making U turn	1	-	3	0.1	1	-
	Merging	50	1.9	52	1.5	58	2.0
	Overtaking	5	0.2	3	0.1	5	0.2
	Parked	7	0.3	5	0 1	10	0.3
	Skidding/swerving	4	0.1	1	-	1	-
	Slowing/stopped	11	0.4	11	0.3	17	0.6
	Turning left	27	1.0	46	1.4	29	1.0
	Turning right	7	0.3	11	0.3	16	0.5
	Unspecified	47	1.7	82	2.5	76	2.6
		495	(18.4)	573	(17.0)	603	(20.5)

.../2

Table B22 Continued

Accident Severity	Vehicle Manoeuvre	Academic Year 1982-83 N	1982-83 %	1983-84 N	1983-84 %	1984-85 N	1984-85 %
Property Damage	Changing lanes	31	1.2	40	1.2	22	0.8
	Going Straight	1139	42.2	1252	37.2	1116	38.0
	Making U turn	-	-	4	0.1	4	0.1
	Merging	329	12.2	402	12.0	323	11.0
	Overtaking	121	4.5	156	4.6	107	3.6
	Parked	32	1.2	44	1.3	46	1.6
	Skidding/swerving	11	0.4	1	-	2	0.1
	Slowing/stopped	37	1.4	62	1.8	58	2.0
	Turning left	159	5.9	149	4.4	119	4.1
	Turning right	122	4.5	167	5.0	157	5.3
	Unspecified	195	7.3	495	14.7	374	12.7
		2176	(81.0)	2772	(82.3)	2328	(79.3)
TOTAL		2688		3367		2935	

Table B23

Reportable School Bus Accidents - Canada - 1982-83 - 1984-85

Apparent Condition of School Buses Involved in Collisions by Accident Severity

Accident Severity	Vehicle Condition	Academic Year 1982-83 N	%	1983-84 N	%	1984-85 N	%
Fatal	No apparent defect	17	0.6	19	0.6	12	0.4
	Unspecified defect	-	-	1	-	-	-
		17	(0.6)	20	(0.6)	12	(0.4)
Personal Injury	Defective engine controls	1	-	-	-	-	-
	Defective brakes	5	0.2	4	0.1	5	0.2
	Defective lighting	1	-	-	-	-	-
	Defective tires	3	0.1	1	-	1	-
	No apparent defect	522	19.7	598	18.2	628	21.1
	Unspecified	16	0.6	12	0.4	-	-
		548	(20.7)	615	(18.7)	634	(21.4)
Property Damage	Defective suspension	3	0.1	1	-	-	-
	Defective engine controls	3	0.1	1	-	1	-
	Defective brakes	12	0.5	3	0.1	15	0.5
	Defective lighting	4	0.2	1	-	1	-
	Defective steering	1	-	3	0.1	-	-
	Defective tires	4	0.2	-	-	1	-
	No apparent defect	1983	74.7	2586	78.6	2303	77.6
	Unspecified	80	3.0	63	1.9	-	-
		2090	(78.7)	2658	(80.7)	2321	(78.2)
TOTAL		2655		3293		2967	